Cost-effectiveness of telephone or surgery asthma reviews: economic analysis of a randomised controlled trial

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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
The use of routine telephone reviews in asthma sufferers was compared with the use of surgery (face-to-face) reviews. Nurses made up to four attempts to call patients in the telephone-review group. Patients in the surgery-review group were invited to make an appointment in the nurse-led asthma clinic in the usual way.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised symptomatic asthma patients who had not been reviewed in the last 12 months. Symptomatic asthma patients were defined in the study as patients who had requested a prescription for a bronchodilator inhaler in the last 6 months.

Setting
The setting was primary care. The economic study was conducted in the UK.

Dates to which data relate
The effectiveness and resource data were collected from a trial undertaken during 2001 for a period of 3 months. The price year was 2000-2001.

Source of effectiveness data
The effectiveness data were derived from a single study (Pinnock et al., see Other Publications of Related Interest).

Link between effectiveness and cost data
The costing was undertaken prospectively on the same patient sample as that used in the effectiveness study.

Study sample
Power calculations were undertaken to determine an appropriate sample size. The authors found that, at the 5% significance level, an 80% power of detecting a 20% difference in the proportion of patients reviewed from 30 to 50% required 206 patients. From a total of 56,062 patients in the study practices, 3,860 adults on the practices' asthma registers were identified, of whom 1,813 had requested a bronchodilator in the last 6 months. Three hundred and seven of the 1,239 patients (69%) who were due for an annual review were excluded, leaving 932 eligible patients. Of the 278
patients who agreed to participate in the study, 141 were assigned to the face-to-face group and 137 to the telephone group. The face-to-face group had a mean age of 56.4 (+/- 17.5) years and 82 (58%) patients were women. The telephone group had a mean age of 54.6 (+/- 17.5) years and 81 (59%) patients were women.

**Study design**

The study was based on a pragmatic, randomised controlled trial (RCT) that was undertaken in four general practices in England. The patients were centrally randomised in blocks of 10 to ensure that approximately equal numbers of patients were allocated to each arm of the study. From point of randomisation to consultation, 6 patients in the face-to-face group and 5 patients in the telephone group withdrew from the study. At the 3-month follow-up, asthma-related quality of life and symptom scores were obtained for 115 patients in the face-to-face group and 114 patients in the telephone group.

**Analysis of effectiveness**

The analysis of the clinical study was conducted on an intention to treat basis. The primary outcome used was the proportion of patients with asthma reviewed within 3 months of randomisation. In the parent clinical study, the authors also assessed specific quality of life, as measured by the Juniper mini asthma quality of life questionnaire. The authors showed the patients to be comparable in terms of their baseline characteristics.

**Effectiveness results**

Of the 137 people randomised to telephone consultation, 101 (74%) patients were reviewed, compared with 68 (48%) patients reviewed in the face-to-face group. The difference was 26% (95% confidence interval, CI: 14 - 37; p<0.001) and the number-needed-to-treat was 3.8.

Three months after randomisation, the two groups did not differ in the Juniper score (risk difference -0.07, 95% CI: -0.27 - 0.13).

**Clinical conclusions**

Compared with face-to-face consultations in the surgery, telephone consultations enabled more people with asthma to be reviewed, without clinical disadvantage or loss of satisfaction.

**Measure of benefits used in the economic analysis**

The measure of benefits used was the proportion of patients with asthma reviewed within 3 months of randomisation.

**Direct costs**

The resource use quantities and costs were reported separately. The direct costs included in the analysis were those to the health service. These covered:

- trial asthma review consultations, including nurse time and telephone costs for the timed duration of consultations (it was also noted whether the calls were local, national, or made to mobile phones);
- aborted telephone calls and appointments missed because patients did not attend for the surgery appointment they had booked;
- primary care consultations with general practitioners or practice nurses (surgery, telephone and home visits, including "out-of-hours") for respiratory conditions, as recorded in the patients' general practice records;
- secondary care contacts (outpatient, accident and emergency attendance, hospital admissions), as identified from patients' general practice records;

all prescriptions for respiratory drugs and devices issued during the 3-month trial; and
prescriptions for antibiotics and oral steroids given for exacerbations of asthma or "chest infections".

A researcher, blinded to allocation, visited each of the practices and validated a random 20% sample of consultation data and data retrieved from records. Health service costs were calculated using unit cost estimates from published UK sources. Discounting was not relevant, as the costs were incurred during 3 months, and was not performed. The study reported the average costs. The price year was 2000-2001.

**Statistical analysis of costs**
The cost and resource use data were treated stochastically. The mean health care costs were calculated and compared with independent sample t-tests, using a 5% level of significance.

**Indirect Costs**
The indirect costs were not included in the analysis.

**Currency**
UK pounds sterling (£).

**Sensitivity analysis**
Sensitivity analyses were undertaken. These were based on the 95% CIs for the proportion reviewed in each group and the duration of consultation for telephone and surgery consultations.

**Estimated benefits used in the economic analysis**
Of the 137 people randomised to telephone consultation, 101 (74%) patients were reviewed, compared with 68 (48%) patients reviewed in the face-to-face group. The difference was 26% (95% CI: 14 - 37; p<0.001) and the number-needed-to-treat was 3.8.

**Cost results**
Using an intention to treat analysis, the mean cost of trial consultation per eligible patient was 5.30 (+/- 2.94) in the telephone group and 5.36 (+/- 6.00) in the face-to-face group. The difference in costs of 0.06 was non significant, (p=0.914). However, as more patients achieved a review in the telephone group, the cost per consultation achieved was significantly lower for telephone consultations (7.19 +/- 2.49 per consultation) than for face-to-face consultation (11.11 +/- 3.50). The mean difference was -3.92 (95% CI: -4.84 - -3.01; p<0.001).

**Synthesis of costs and benefits**
The costs and benefits were not combined.

The results from the sensitivity analyses showed that, for all scenarios, the cost per consultation achieved favoured the telephone review. When combining the least favourable scenarios from both analyses (i.e. lowest telephone review rate plus longest calls versus highest surgery review rate plus shortest consultations), the estimated cost-saving per consultation was 2.87.

**Authors' conclusions**
Telephone consultation enabled a greater proportion of asthma patients to be reviewed at no additional cost to the health service.

**CRD COMMENTARY - Selection of comparators**
Although no explicit justification was given for using face-to-face asthma reviews as the comparator, it would appear that this form of consultation represented current practice in the authors' setting. You should decide if the comparator represents current practice in your own setting.

**Validity of estimate of measure of effectiveness**

The analysis was based on an RCT. This was appropriate for the study question, as well-conducted RCTs are considered the 'gold' standard when comparing health interventions. The authors reported that their study sample was slightly older than the total eligible population, which could limit the generalisability of their results. In addition, the authors focused on patients with active asthma, which was defined as having requested a bronchodilator inhaler in the last 6 months. Hence, patients using even less medication could be even more reluctant to attend the surgery for a review, possibly increasing the advantage of opportunistic phone calls. The patient groups were shown to be comparable at analysis. The analysis of effectiveness was handled credibly, and appropriate statistical analyses were conducted to test for significant differences. Further, as demonstrated by the power calculations, the study was powered sufficiently to detect significant differences.

**Validity of estimate of measure of benefit**

The estimation of benefits was obtained directly from the effectiveness analysis.

**Validity of estimate of costs**

All the categories of cost relevant to the health service perspective adopted were included in the analysis. No relevant costs appear to have been omitted from the analysis. The costs and the quantities were reported separately, which will increase the generalisability of the authors' results. The resource use quantities were derived from the clinical study. Appropriate statistical analyses were used to test for any significant differences between the two groups. Sensitivity analyses of resource use were performed, but only by varying the duration of consultations and the proportion of patients reviewed. The unit costs were derived from published sources. No sensitivity analysis of the prices was conducted. Appropriate statistical techniques were used to detect significant cost-differences between the two groups. Since all the costs were incurred during 3 months, discounting was unnecessary and hence was not performed. The price year was reported, which will aid any possible inflation exercises.

**Other issues**

The authors made appropriate comparisons of their findings with those from other studies that had found similar results. However, some reports suggested possible disadvantages of telephone contacts, such as telephone triage of requests for same-day appointments leading to an increase in subsequent surgery consultations. The issue of generalisability to other settings was partially addressed in the sensitivity analysis. The authors did not present their results selectively and their conclusions reflected the scope of the analysis. The authors reported a number of further limitations to their study. First, the study nurses were all experienced in providing asthma care, which may have affected the efficiency with which they undertook reviews both in the surgery and on the telephone. Second, the short duration of the study might have reduced the chance of demonstrating a difference between the two groups in total respiratory costs.

**Implications of the study**

The authors reported that a telephone option, as part of an asthma review service, has the potential to increase access to asthma care cost-effectively.

**Source of funding**

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Other publications of related interest


Indexing Status
Subject indexing assigned by CRD

MeSH
Adrenal Cortex Hormones /administration & dosage /therapeutic use; Asthma /drug therapy /prevention & control; Bronchodilator Agents /administration & dosage /therapeutic use; Costs and Cost Analysis; Health Care Costs; Prednisolone /therapeutic use; Primary Health Care; Randomized Controlled Trials as Topic; Receptors, Adrenergic, beta-2 /administration & dosage /therapeutic use; Receptors, Cholinergic /administration & dosage /therapeutic use; Receptors, Leukotriene /administration & dosage /therapeutic use; Referral and Consultation; Telephone; Theophylline /administration & dosage /therapeutic use

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